CHAPTER 2

DESCRIPTION OF THE WATTS BAR WATERSHED

2.1 BACKGROUND.

Although the origin of the name “Watts” is uncertain, Watts Bar Reservoir is named for Watt Island, a Tennessee River island at mile 529.9. Watts Bar Reservoir was created when the Tennessee River was dammed in 1942. Many resorts are located on Watts Bar Lake, which is known for its supply of black bass and crappie. Springs and caves are relatively numerous in the area. There is great habitat diversity supporting the diverse fish fauna. Many waterfalls occur in the watershed where softer rocks erode under the sandstone cap.

This Chapter describes the location and characteristics of the Watts Bar Watershed.

2.2. DESCRIPTION OF THE WATERSHED.

2.2.A. General Location. The Watts Bar Watershed is located in East Tennessee and includes parts of Bledsoe, Cumberland, Loudon, Meigs, McMinn, Monroe, Rhea, and Roane Counties.

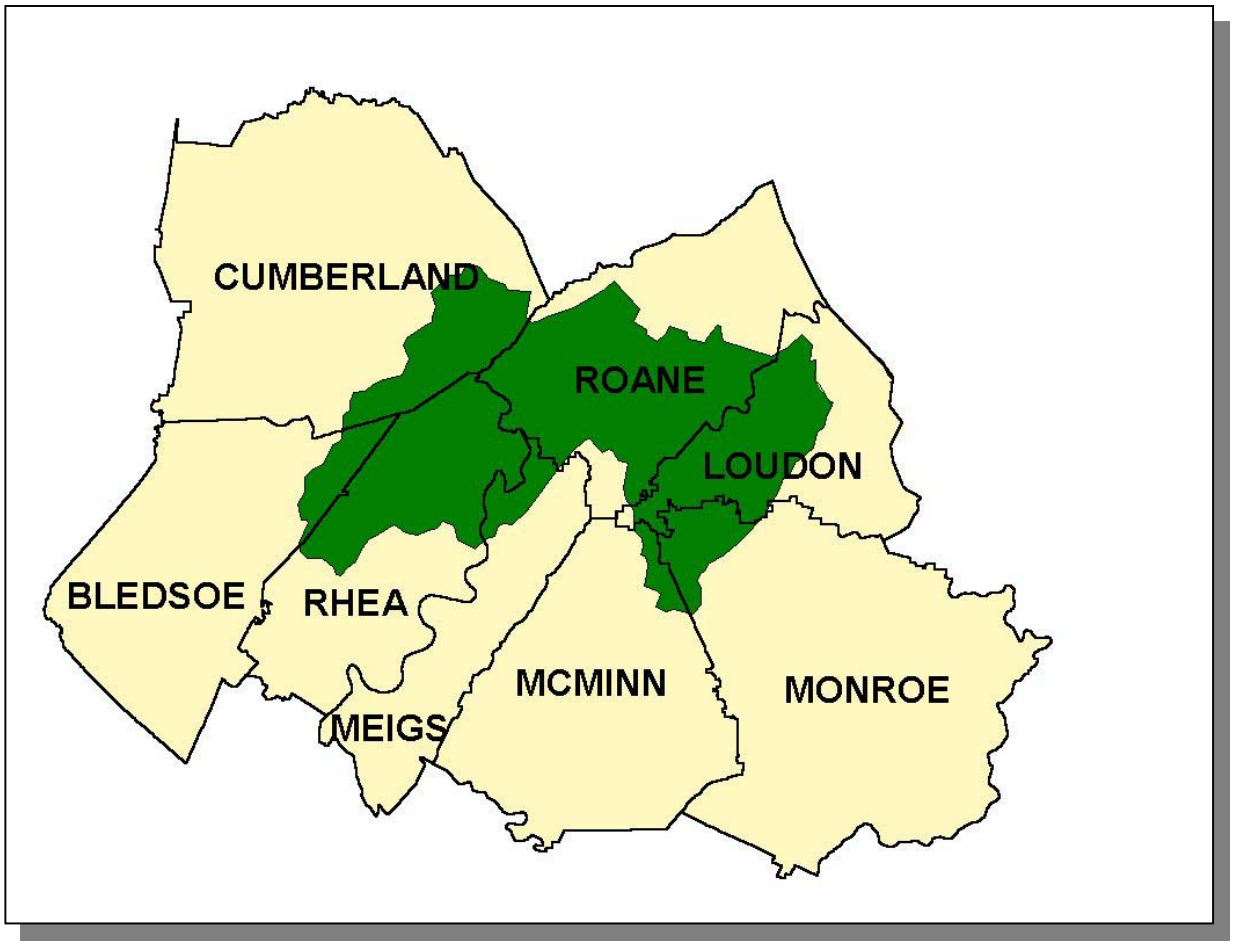

Figure 2-1. General Location of the Watts Bar Watershed.

COUNTY	% OF WATERSHED IN EACH COUNTY
Loudon	30.8
McMinn	22.0
Roane	21.0
Cumberland	12.0
Meigs	5.2
Bledsoe	4.0
Rhea	3.0
Monroe	1.9

Table 2-1. The Watts Bar Watershed Includes Parts of Eight East Tennessee Counties.

2.2.B. Population Density Centers. Two interstates (I-40, I-75) and four state highways serve the major communities in the Watts Bar Watershed.

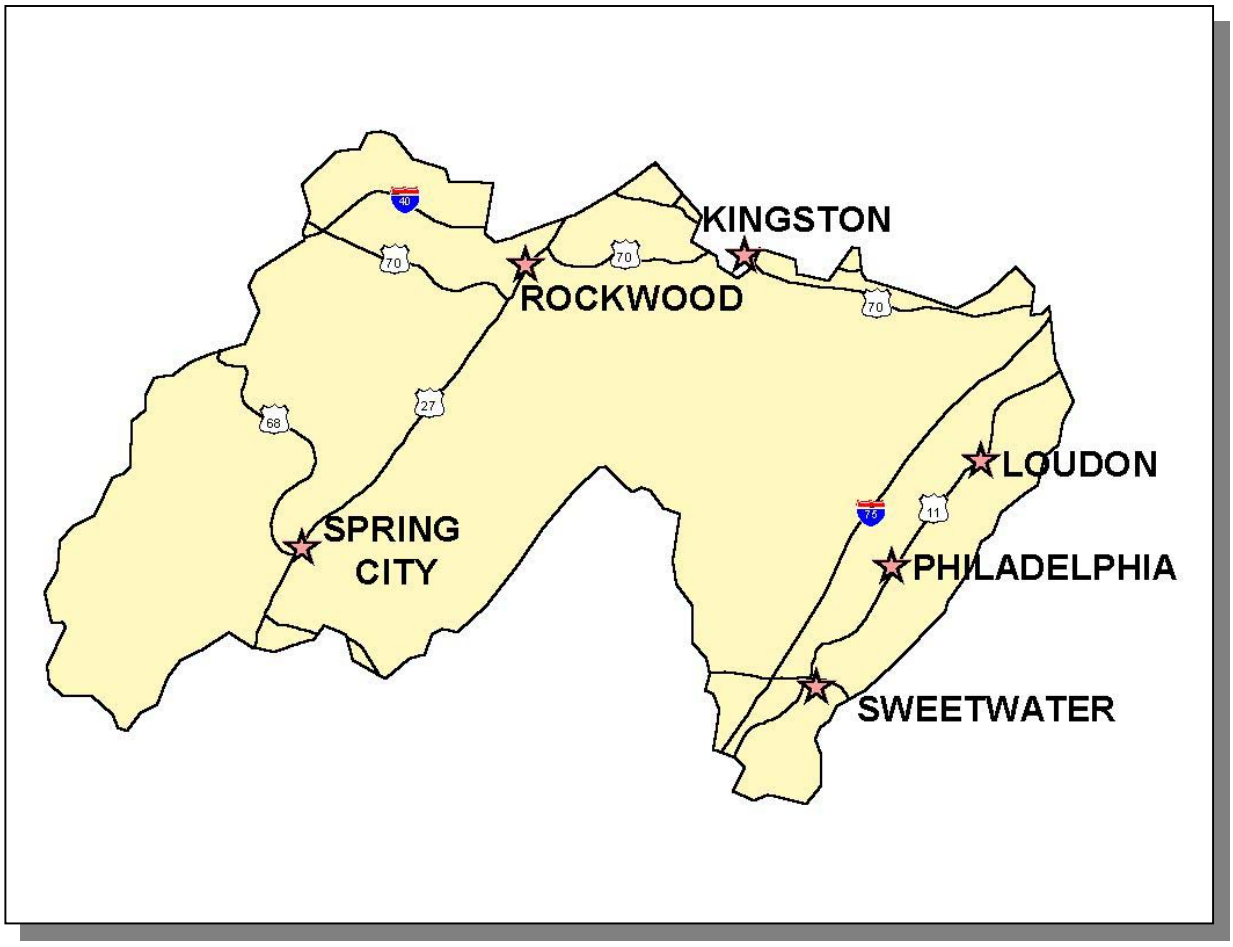

Figure 2-2. Municipalities and Roads in the Watts Bar Watershed.

MUNICIPALITY	POPULATION	COUNTY
Rockwood	5,348	Roane
Sweetwater	5,066	Monroe
Kingston*	4,552	Roane
Loudoun*	4,026	Loudon
Spring City	2,199	Rhea
Philadelphia	463	Loudon

Table 2-2. Municipalities in the Watts Bar Watershed. *Population based on 1990 census (Tennessee Blue Book). Asterisk (*) indicates county seat.*

2.3. GENERAL HYDROLOGIC DESCRIPTION.

2.3.A. Hydrology. The Watts Bar/Fort Loudoun Watershed, designated the Hydrologic Unit Code of 06010201 by the USGS, is approximately 1355 square miles. The Watts Bar portion is approximately 684 square miles.

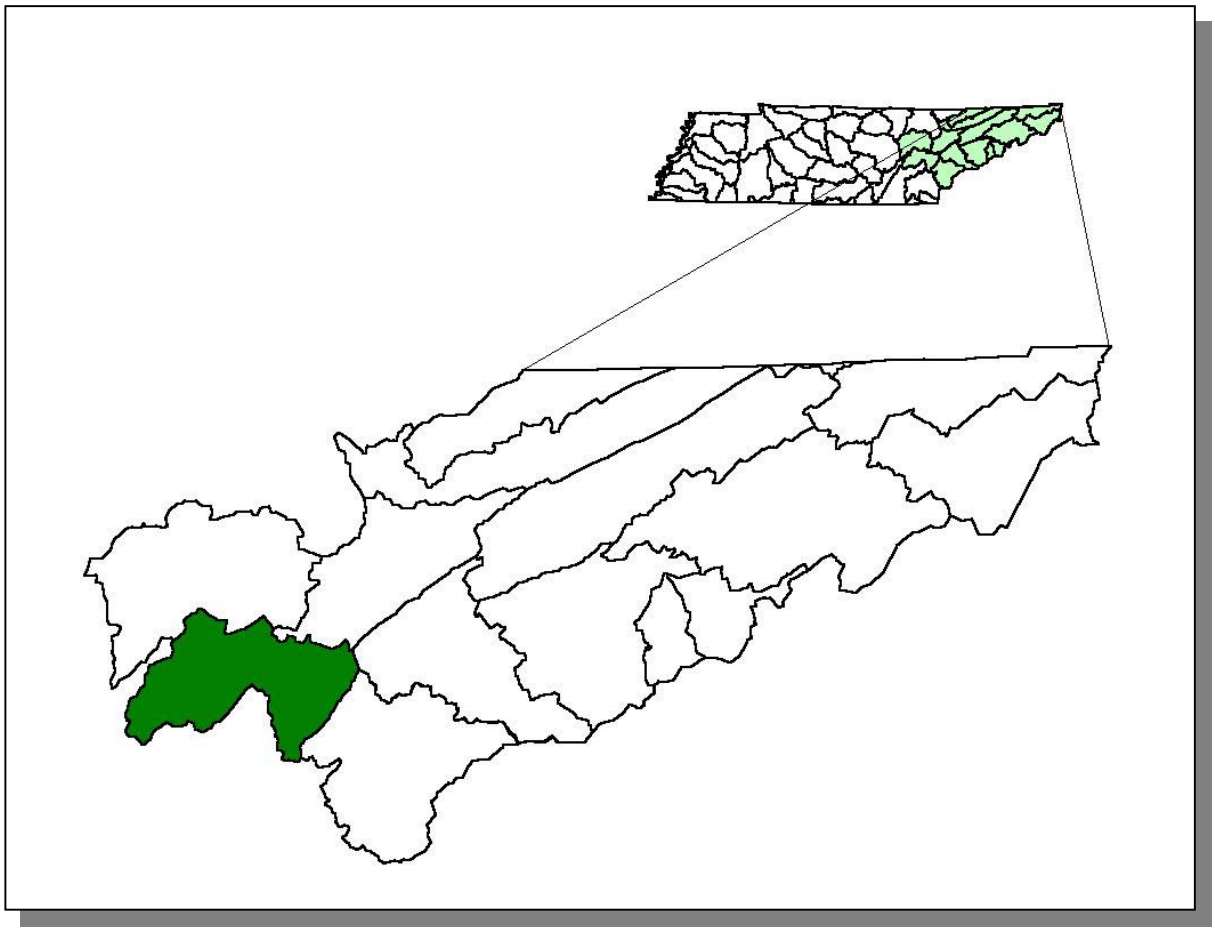

Figure 2-3. The Watts Bar Watershed is Part of the Upper Tennessee River Basin.

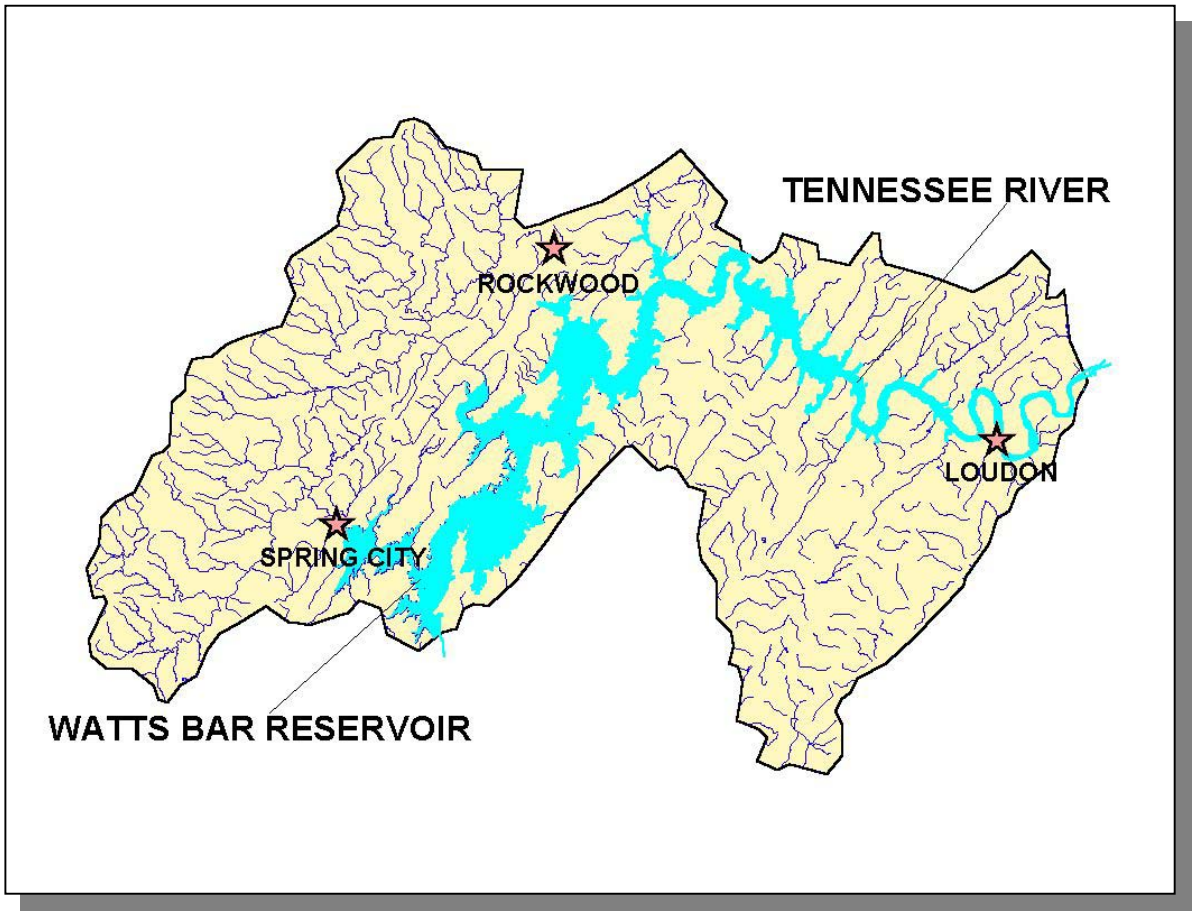

Figure 2-4. Hydrology in the Watts Bar Watershed. *There are 875 stream miles (1,842 stream miles in the entire HUC 8 watershed) and 15,600 lake acres recorded in River Reach File 3 in the Watts Bar Watershed. Locations of Watts Bar Reservoir, Tennessee River, and the cities of Loudon, Rockwood, and Spring City are shown for reference.*

2.3.B. Dams. There are 9 dams inventoried by TDEC Division of Water Supply in the Watts Bar Watershed. These dams either retain at least 30 acre-feet of water or have structures at least 20 feet high. Additional dams may be found in the watershed.

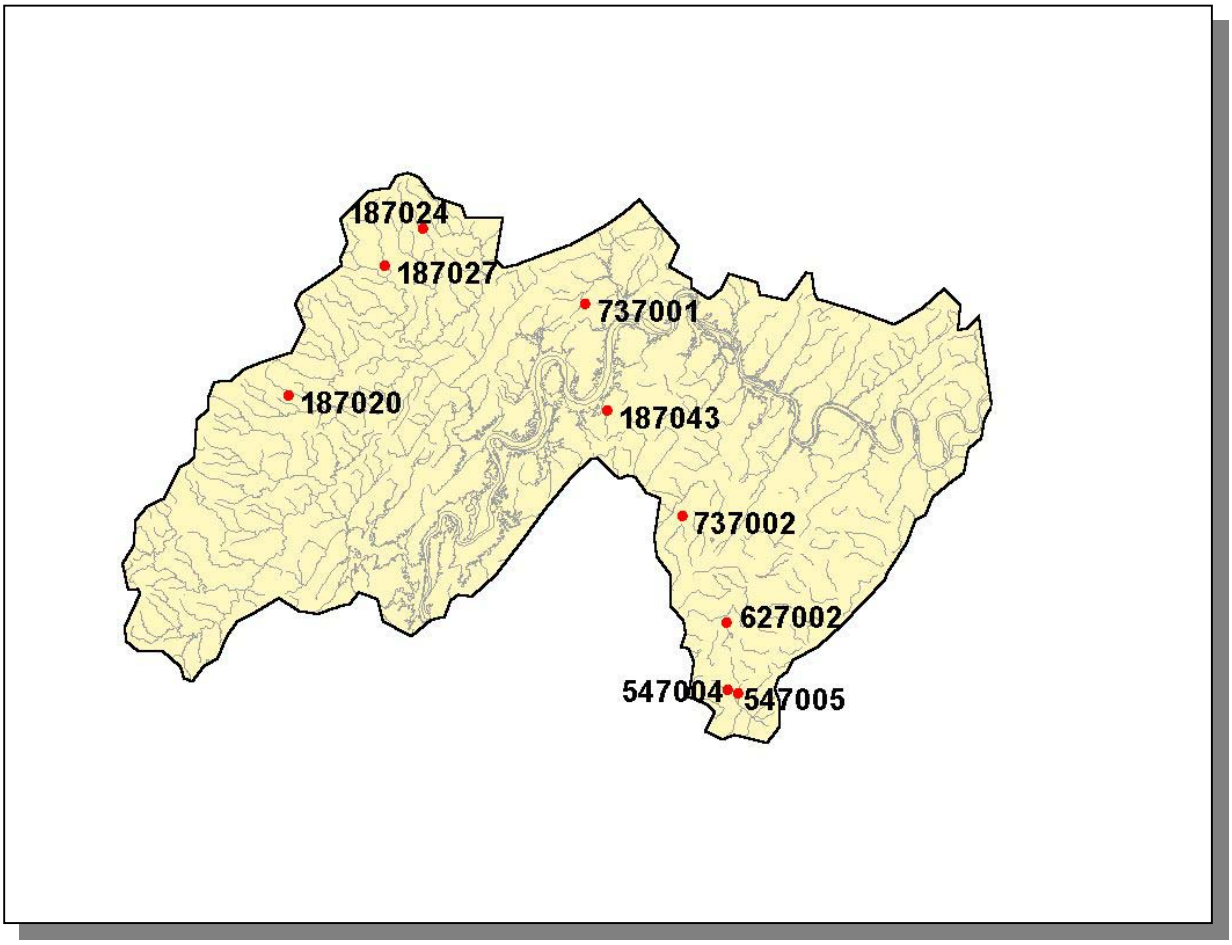

Figure 2-5. Location of Inventoried Dams in the Watts Bar Watershed. *Additional information is provided in Watts Bar-Appendix II.*

2.4 LAND USE. Land Use/Land Cover information was provided by EPA Region 4 and was interpreted from 1992 Multi-Resolution Land Cover (MRLC) satellite imagery.

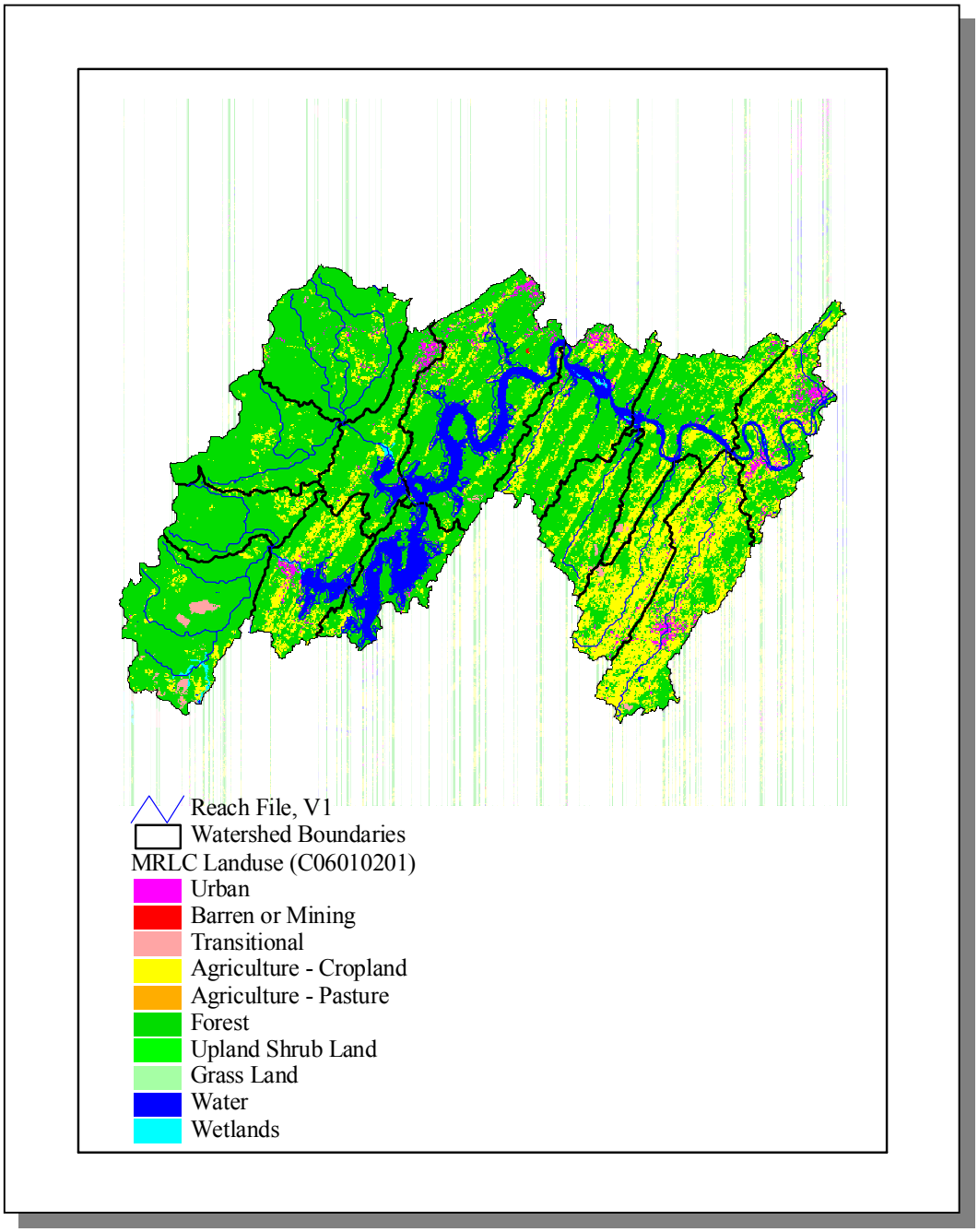

Figure 2-6. Illustration of Select Land Cover/Land Use Data from MRLC Satellite Imagery.

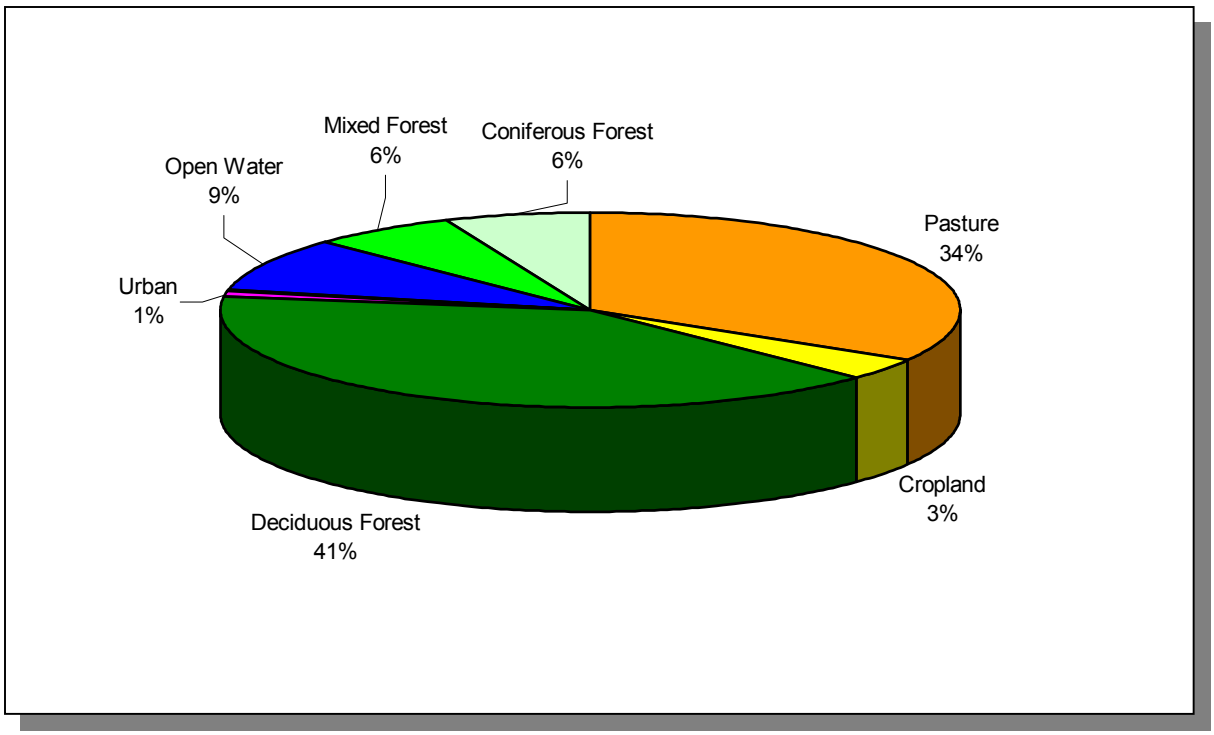

Figure 2-7. Land Use Distribution in the Watts Bar Watershed. *More information is provided in Watts Bar-Appendix II.*

2.5 ECOREGIONS AND REFERENCE STREAMS. Ecoregions are defined as relatively homogeneous areas of similar geography, topography, climate and soils that support similar plant and animal life. Ecoregions serve as a spatial framework for the assessment, management, and monitoring of ecosystems and ecosystem components. Ecoregion studies include the selection of regional stream reference sites, identifying high quality waters, and developing ecoregion-specific chemical and biological water quality criteria.

There are eight Level III Ecoregions and twenty-five Level IV subecoregions in Tennessee. The Watts Bar Watershed lies within 2 Level III ecoregion (Ridge and Valley, Southwestern Appalachians) and contains 5 Level IV subecoregions (Griffen, Omernik, Azavedo, 1977):

- Southern Limestone/Dolomite Valleys and Low Rolling Hills (67f) form a heterogeneous region composed predominantly of limestone and cherty dolomite. Landforms are mostly low rolling ridges and valleys, and the soils vary in their productivity. Landcover includes intensive agriculture, urban and industrial, or areas of thick forest. White oak forests, bottomland oak forest, and sycamore-ash-elm riparian forest are the common forest types, and grassland barrens intermixed with cedar-pine glades also occur here.

- The Southern Dissected Ridges and Knobs (67i) contain more crenulated, broken, or hummocky ridges, compared to the smoother, more sharply pointed sandstone ridges of Ecoregion 67h. Although shale is common, there is a mixture and interbedding of geologic materials. The ridges on the east side of Tennessee's Ridge and Valley tend to be associated with the Ordovician-age Sevier shale, Athens shale, and Holston and Lenoir limestones. These can include calcareous shale, limestone, siltstone, sandstone, and conglomerate. In the central and western part of Ecoregion 67, the shale ridges are associated with the Cambrian-age Rome Formation: shale and siltstone with beds of sandstone. Chestnut oak forest and pine forests are typical for the higher elevations of the ridges, with areas of white oaks, mixed mesophytic forest, and tulip poplar on the lower slopes, knobs, and draws.

- Southern Shale Valleys (67g) consist of lowlands, rolling valleys, and slopes and hilly areas that are dominated by shale materials. The northern areas are associated with Ordovician-age calcareous shale, and the well-drained soils are often slightly acid to neutral. In the south, the shale valleys are associated with Cambrian-age shales that contain some narrow bands of limestone, but the soils tend to be strongly acidic. Small farms and rural residences subdivide the land. The steeper slopes are used for pasture or have reverted to brush and forested land, whils small fields of hay, corn, tobacco, and garden crops are grown on the foot slopes and bottom land.

- The Cumberland Plateau's (68a) tablelands and open low mountains are about 1000 feet higher than the Eastern Highland Rim (71g) to the west, and receive slightly more precipitation with cooler annual temperatures than the surrounding lower-elevation ecoregions. The plateau surface is less dissected with lower relief compared to the Cumberland Mountains (69d) or the Plateau Escarpment (68c). Elevations are generally 1200-2000 feet, with the Crab Orchard Mountains reaching over 3000 feet. Pennsylvanian-age conglomerate, sandstone, siltstone, and shale is covered by mostly well-drained, acid soils of low fertility. The region is forested, with some agriculture and coal mining activities.

- The Plateau Escarpment (68c) is characterized by steep, forested slopes and high velocity, high gradient streams. Local relief is often 1000 feet or more. The geologic strata include Mississippian-age limestone, sandstone, shale, and siltstone, and Pennsylvanian-age shale, siltstone, sandstone, and conglomerate. Streams have cut down into the limestone, but the gorge talus slopes are composed of colluvium with huge angular, slabby blocks of sandstone. Vegetation community types in the ravines and gorges include mixed oak and chestnut oak on the upper slopes, more mesic forests on the middle and lower slopes (beech-tulip poplar, sugar maple-basswood-ash-buckeye), with hemlock along rocky streamsides and river birch along floodplain terraces.

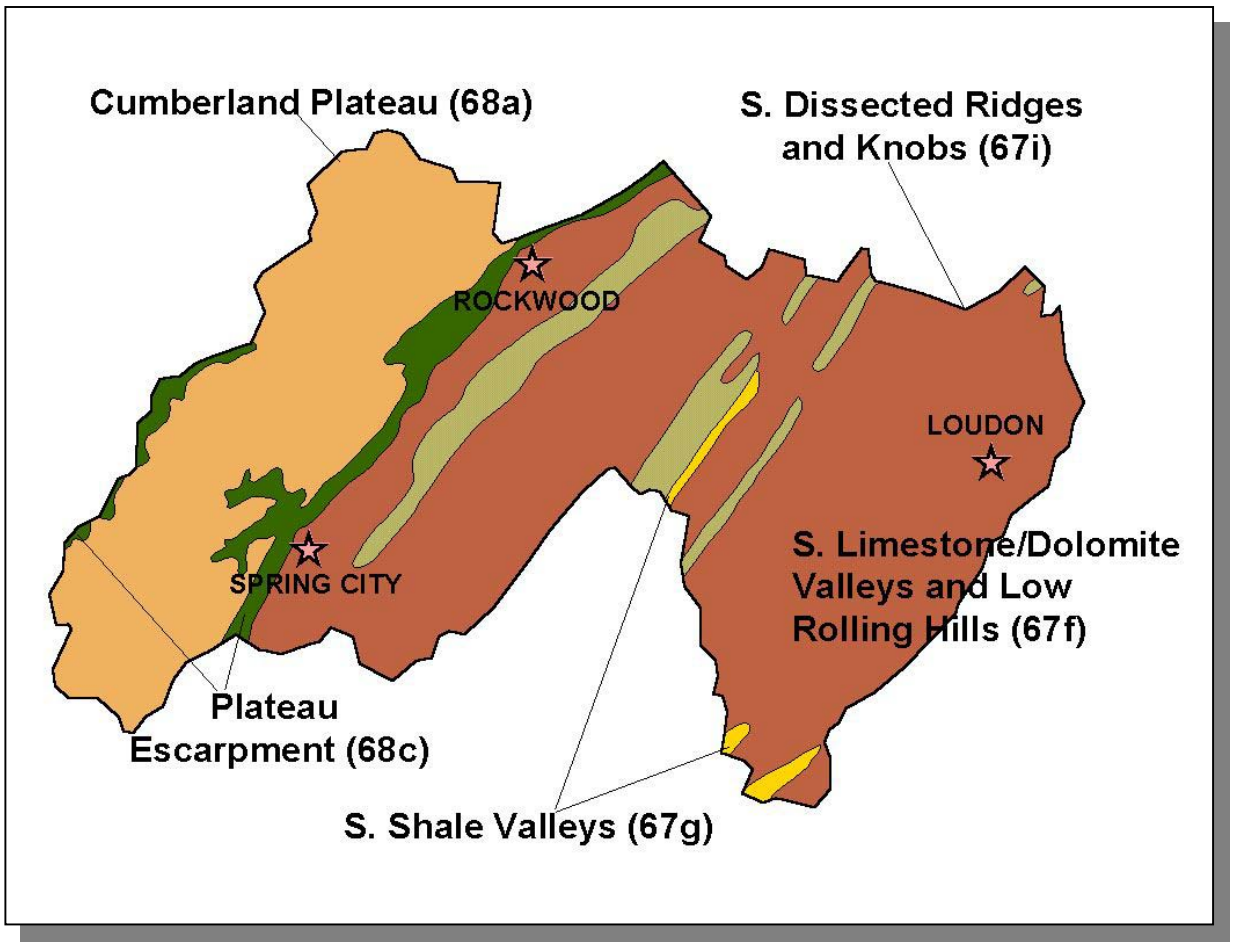

Figure 2-8. Level IV Ecoregions in the Watts Bar Watershed. *Locations of Loudon, Rockwood, and Spring City are shown for reference.*

Each Level IV Ecoregion has at least one reference stream associated with it. A reference stream represents a least impacted condition and may not be representative of a pristine condition.

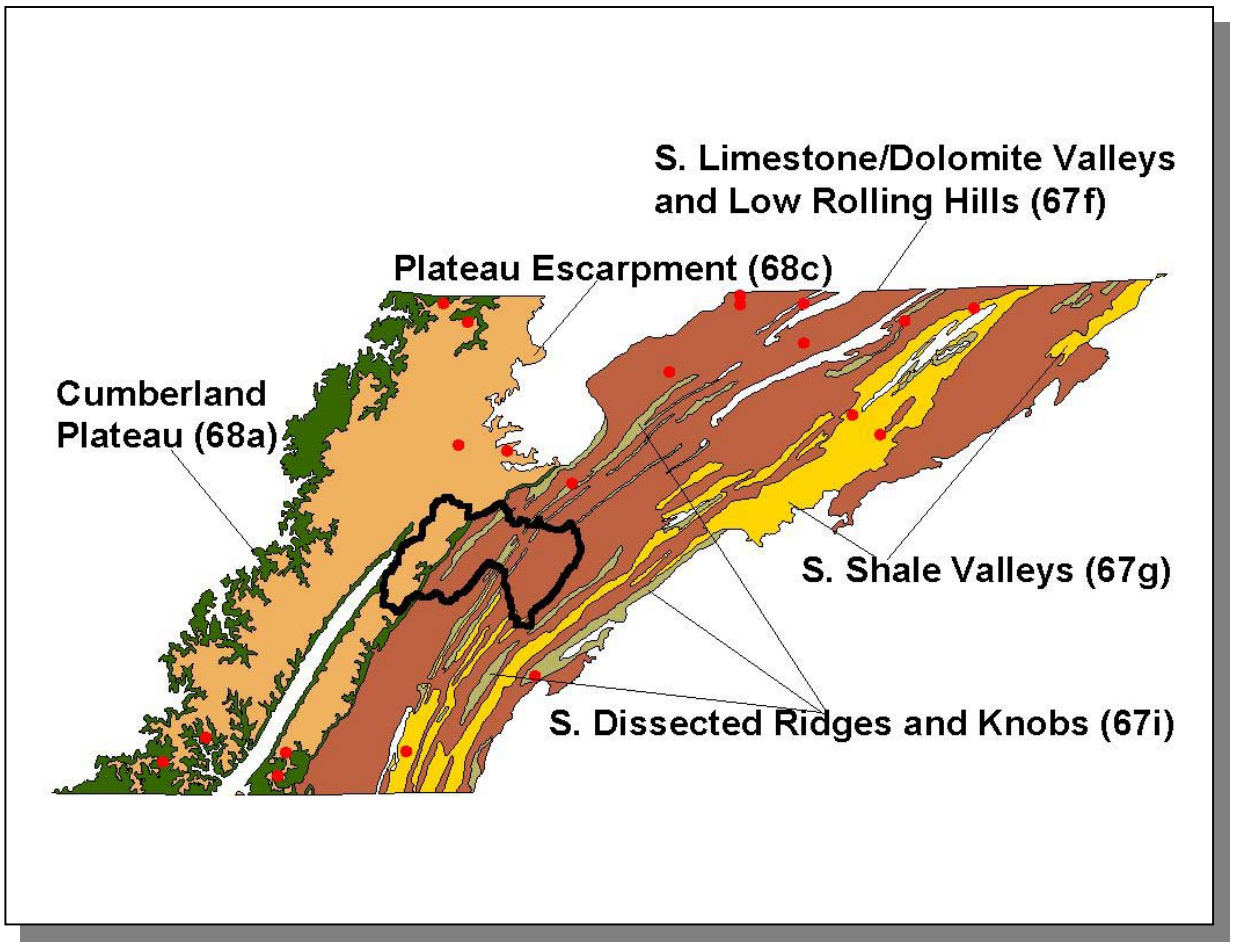

Figure 2-9. Ecoregion Monitoring Sites in Level IV Ecoregions 67f, 67g, 67i, 68a, and 68c. *The Watts Bar Watershed is shown for reference. Additional information is provided in Watts Bar-Appendix II.*

2.6. NATURAL RESOURCES.

2.6.A. Designated State Natural Areas. The Natural Areas Program was established in 1971 with the passage of the Natural Areas Preservation Act. The Watts Bar Watershed has two Designated State Natural Areas:

Ozone Falls Designated State Natural Area is, at 127 feet, the largest waterfall in Cumberland County.

Stinging Fork Falls Pocket Wilderness Designated State Natural Area is owned by Bowater Southern Paper Company and has a 30 foot waterfall on Stinging Fork Creek.

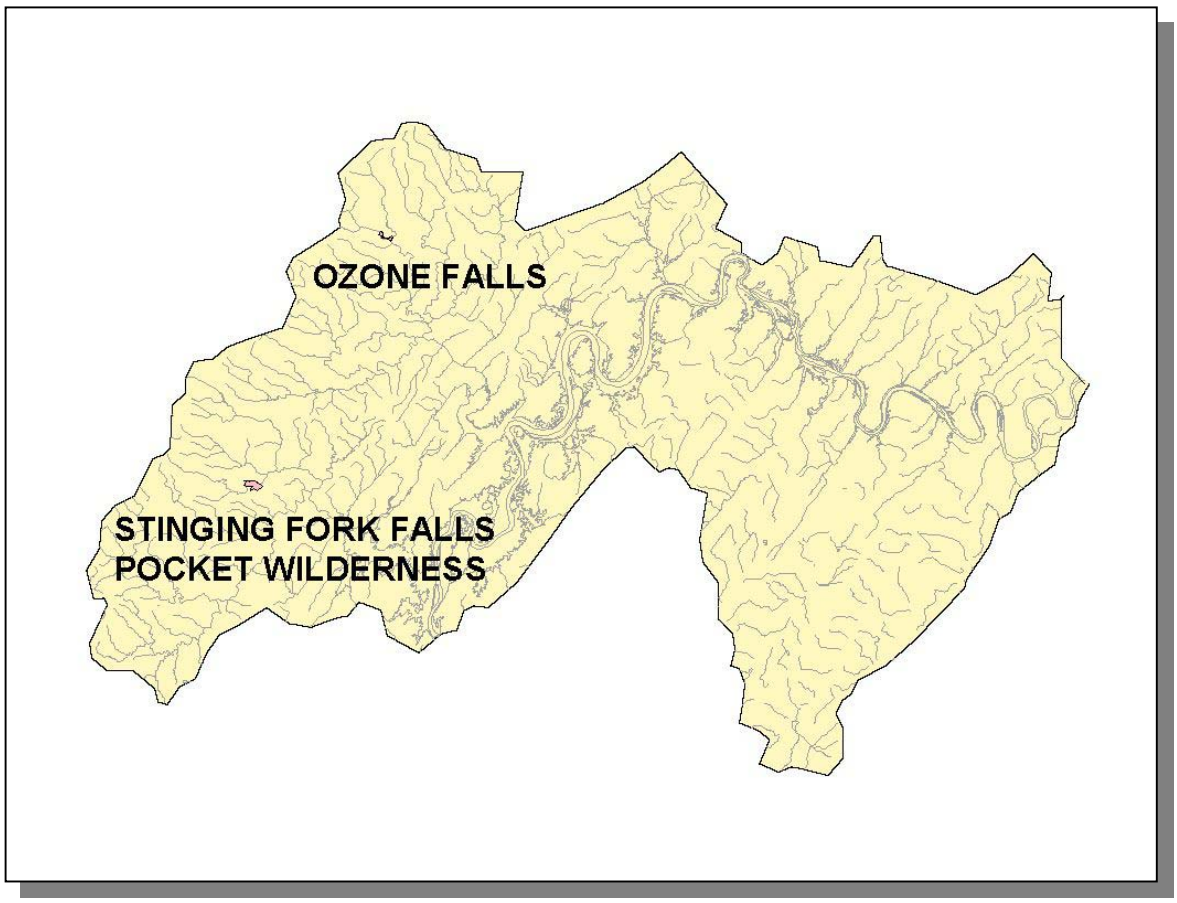

Figure 2-10. There are Two Designated State Natural Areas in the Watts Bar Watershed.

2.6.B. Rare Plants and Animals. The Heritage Program in the TDEC Division of Natural Heritage maintains a database of rare species that is shared by partners at The Nature Conservancy, Tennessee Wildlife Resources Agency, the US Fish and Wildlife Service, and the Tennessee Valley Authority. The information is used to: 1) track the occurrence of rare species in order to accomplish the goals of site conservation planning and protection of biological diversity, 2) identify the need for, and status of, recovery plans, and 3) conduct environmental reviews in compliance with the Federal Endangered Species Act.

GROUPING	NUMBER OF RARE SPECIES
Crustaceans	0
Insects	1
Mussels	6
Snails	8
Amphibians	7
Birds	17
Fish	12
Mammals	14
Reptiles	3
Plants	58
Total	**126**

Table 2-3. There are 126 Documented Rare Plant and Animal Species in the Watts Bar Watershed. Additional rare plant and animal species may be present.

Additionally, in the Watts Bar Watershed, there are twelve rare fish species, seven rare snail species, and seven rare mussel species.

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS
Anguilla rostrata	American eel		
Cyprinella monacha	Spotfin chub	T	E
Etheostoma cinereum	Ashy darter		D
Etheostoma percnurum	Duskytail darter	E	E
Hemitremia flammea	Flame chub		D
Noturus flavipinnis	Yellowfin madtom	E	E
Percina aurantiaca	Tangerine darter		D
Percina burtoni	Blotchside darter		D
Percina macrocephala	Longhead darter		T
Percina tanasi	Snail darter	T	T
Phoxinus sp.	Laurel dace		E
Phoxinus tennesseensis	Tennessee dace		D
Athearnia anthonyi	Anthony's river snail	E	E
Io Fluvialis	Spiny riversnail		
Lithasia geniculata	Ornate rocksnail		
Lithasia verrucosa	Varicose rocksnail		
Mesodon jonesianus	Big-toothed covert		
Paravitrea clappi	Mirey ridge supercoil		
Pilsbryna aurea	Ornate bud		
Conradilla caelata	Birdwing pearlymussel	E	E
Dromus dromas	Dromedary pearlymussel	E	E
Epioblasma torulosa torulosa	Tubercled blossom	E	E
Fusconaia cuneolus	Fine-rayed pigtoe	E	E
Fusconaia edgariana	Shiny pigtoe	E	E
Lampsilis abrupta	Pink mucket	E	E
Plethobasus cooperianus	Orange-foot pimpleback	E	E

Table 2-4. Rare Aquatic Species in the Watts Bar Watershed*. Federal Status: E, Listed Endangered by the U.S. Fish and Wildlife Service; T, Listed Threatened by the U.S. Fish and Wildlife Service. State Status: E, Listed Endangered by the Tennessee Wildlife Resources Agency; T, Listed Threatened by the Tennessee Wildlife Resources Agncy. D, Deemed in Need of Management by the Tennessee Wildlife Resources Agency.*

2.6.C. Wetlands. The Division of Natural Heritage maintains a database of wetland records in Tennessee. These records are a compilation of field data from wetland sites inventoried by various state and federal agencies. Maintaining this database is part of Tennessee's Wetland Strategy, which is described at http://www.state.tn.us/environment/epo/wetlands/strategy.zip.

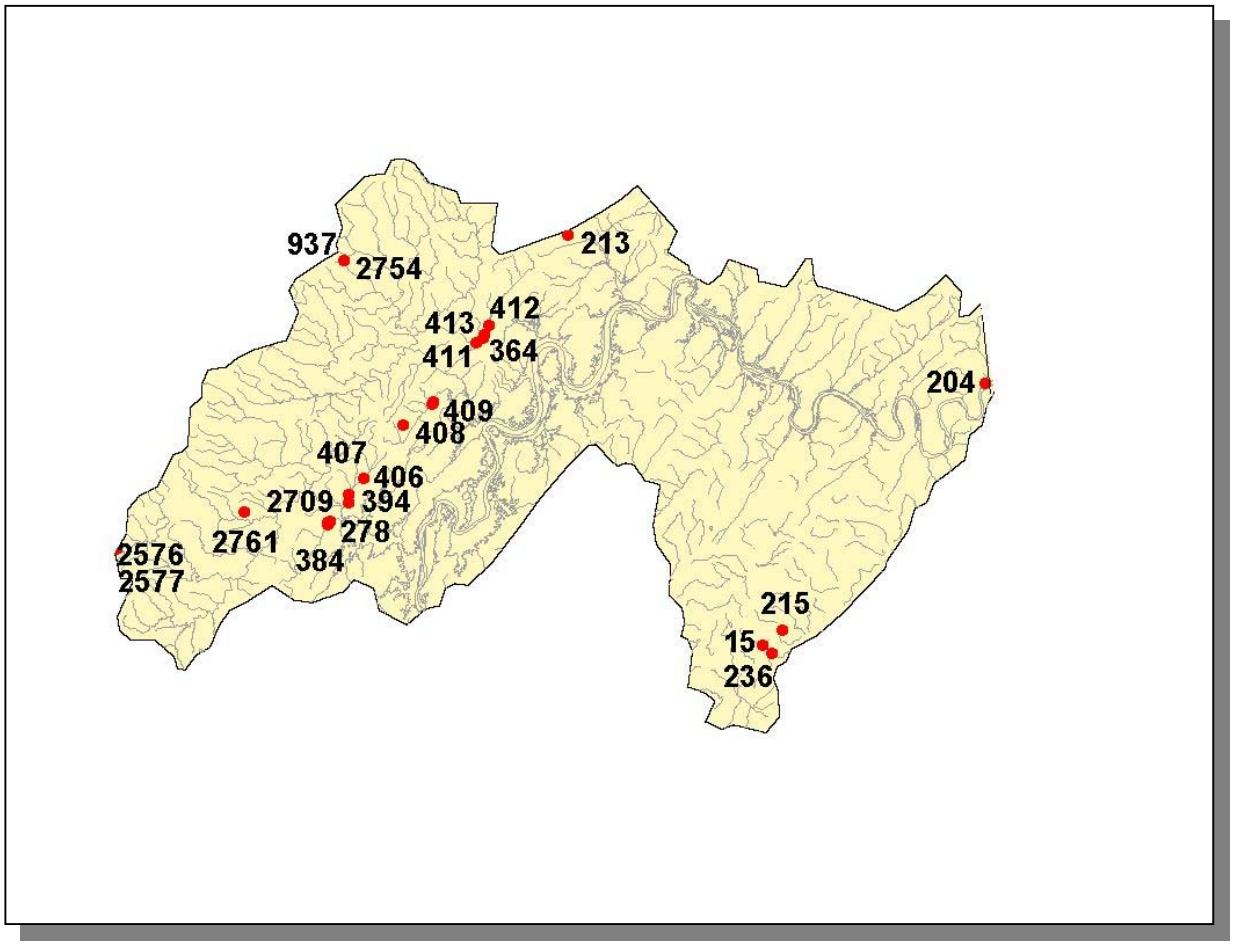

Figure 2-11. Location of Wetland Sites in TDEC Division of Natural Heritage Database in Watts Bar Watershed. There may be additional wetland sites in the watershed. *More information is provided in Watts Bar-Appendix II.*

2.7. CULTURAL RESOURCES.

2.7.A. Interpretive Areas. Some sites representative of the cultural heritage are under state or federal protection:

- Mt. Roosevelt State Forest, a breathtaking view of the valley, Watts Bar Lake, and the Great Smoky Mountains

In addition, many local interpretive areas are common, most notably:

- Piney River Trail, a natural wilderness area with waterfalls, forests, unique rock formations, deep gorges, and trails for hiking
- Twin Rocks Nature Trail, 2.5 miles leading to an overlook of Soak Creek and Piney River Gorges
- Hornsby Hollow Recreation Area, located on Watts Bar Lake, offers sport fishing, rustic camping, family watersports, and hiking trails
- Rockwood Beach, location of several fishing tournaments, swimming, and watersports

2.7.B. Wildlife Management Area. The Tennessee Wildlife Resources Agency manages Luper Mountain Wildlife Management Area (WMA), Mount Roosevelt WMA, Riley Creek Unit of the Watts Bar WMA, and Thief Neck Island WMA in the Watts Bar Watershed.

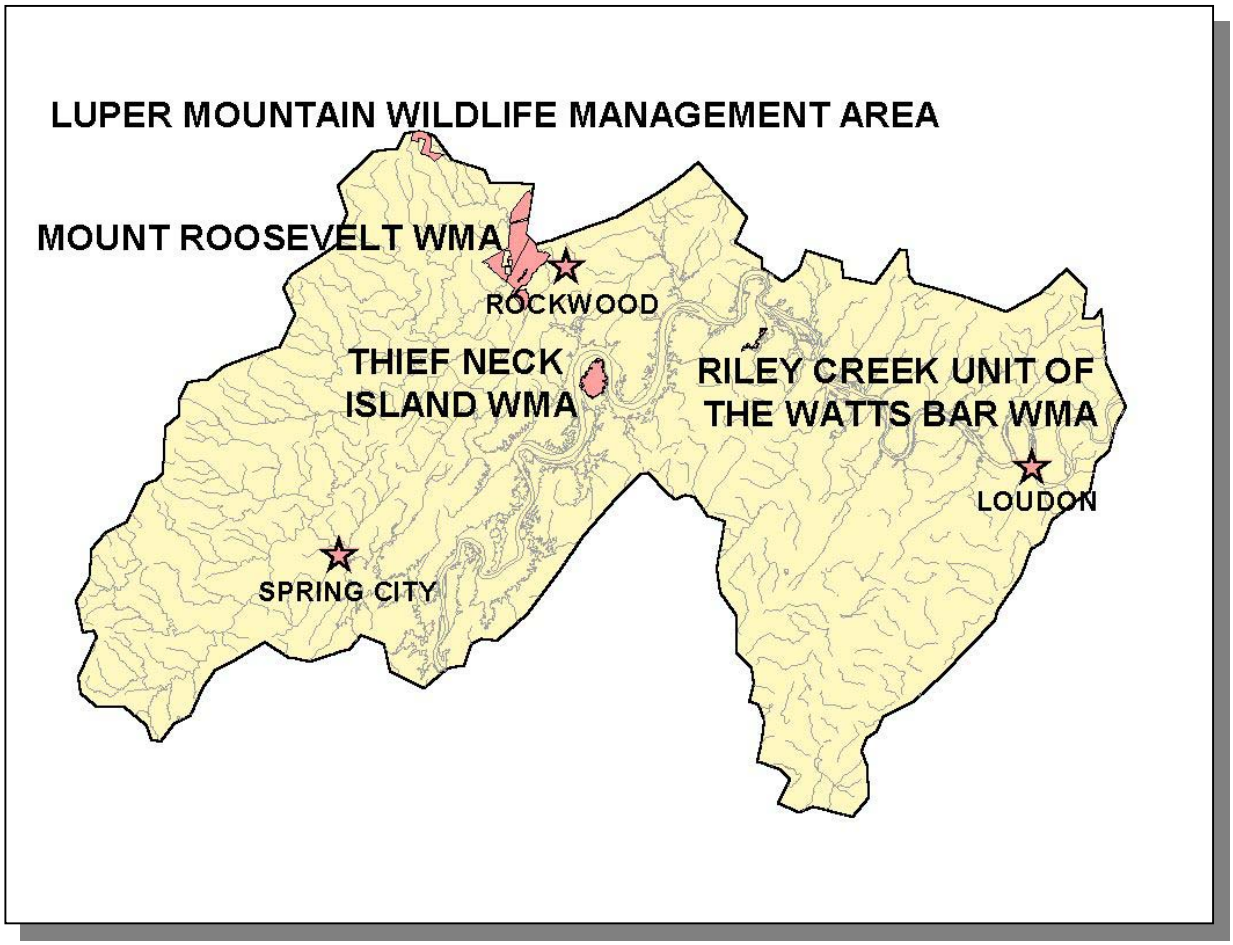

Figure 2-12. TWRA Manages Four Wildlife Management Areas in the Watts Bar Watershed. *Locations of Loudon, Rockwood, and Spring City are shown for reference.*

2.8. TENNESSEE RIVERS ASSESSMENT PROJECT. The Tennessee Rivers Assessment is part of a national program operating under the guidance of the National Park Service's Rivers and Trails Conservation Assistance Program. The Assessment is an inventory of river resources, and should not be confused with "Assessment" as defined by the Environmental Protection Agency. A more complete description can be found in the Tennessee Rivers Assessment Summary Report, which is available from the Department of Environment and Conservation and on the web at:

http://www.state.tn.us/environment/wpc/riv

STREAM	NSQ	RB	RF	STREAM	NSQ	RB	RF
Buck Creek	3		2	Paint Rock Creek	3		3
Cane Creek	1			Piney Creek	1	2	3
Carr Creek	4			Piney River	1	2	
Cave Creek	3		2	Pistol Creek	3		
Cloyd Creek	3			Pitner Creek	3		
Crooked Creek	3			Polecat Creek	3		
Dunlap Creek	2			Pond Cave Creek	2		
Duskin Creek	2			Pond Creek	4		2
Ellejoy Creek	3		2	Reed Creek	3		
Fall Creek	1		3	Riley Creek	3		2
First Creek	4			Roddy Creek	4		
Flag Creek	4			Sandy Creek	2		
Flat Creek	2			Second Creek	4		
Hesse Creek	1,3			Smith Creek	3		
Hines Creek	3			Soak Creek	2,3		
Laurel Creek	1			Stamp Crek	3		
Little Ellejoy Creek	3			Steekee Creek	3		
Little Paint Rock Creek	3	3		Sweetwater Creek	3	3	
Little River	2	1,2	1,2,4	Taylor Branch Creek	4		
Little Turkey Creek	4			Third Creek	4		
Mammys Creek	1	2		Town Creek	4		
Middle Prong Little River	1			Tributary to Laurel Lake	3		
Moccasin Creek				Turkey Creek	3		2
Muddy Creek				Tributary to Watts Bar	3		
Nails Creek	3		3	Whites Creek	1	2	
North Fork Basin Creek	2			Wolf Creek	2,4		2
North Fork Turkey Creek	3						

Table 2-5. Stream Scoring from the Tennessee Rivers Assessment Project

Categories: NSQ, Natural and Scenic Qualities
RB, Recreational Boating
RF, Recreational Fishing

Scores: 1. Statewide or greater Significance; Excellent Fishery
2. Regional Significance; Good Fishery
3. Local Significance; Fair Fishery
4. Not a significant Resource; Not Assessed as a fishery